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WARZYN

Engineering & Surveying
Environmental Services
Waste Management
Water Resources
Site Development
Surface Structures
Geotechnical Analysis

July 14, 1987
60251

Andrew H. Perellis, ESQ.
Gessler, Wexler, Flynn, Laswell & Fleischmann, Ltd.
Three First National Plaza, Suite 2300
Chicago, IL 60602

RE: Summary Scope of Work
American Chemical Services RI/FS
Griffith, Indiana

Dear Mr. Perellis:

Warzyn Engineering Inc. (Warzyn) is pleased to present a summary of a proposed approach and conceptual framework for conducting the Remedial Investigation/ Feasibility Study (RI/FS) at the American Chemical Services Site (ACS) in Griffith, Indiana. The plan has been developed to accomplish the RI/FS goals presented in EPA guidance documents, and specifically, the objectives enumerated in the EPA work plan developed by Roy F. Weston Inc. (Weston) for the ACS Site. The premise of the Warzyn plan however, varies somewhat from EPA's focus. Warzyn's approach recognizes that the system is dynamic and that activities at the ACS facility and the Griffith Landfill are currently making a significant impact on the groundwater system. The original EPA work plan does not incorporate these factors. This letter summarizes a proposed scope of work which Warzyn would use to accomplish the RI. The objectives for the RI are listed in Attachment 1.

## CONCEPTUAL APPROACH

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discussions of the significance of each phase to the whole RI/FS process. For clarity of discussion, FS objectives and work scope are not included in this framework.

## SCOPE OF WORK

Warzyn has developed the proposed scope of work on the basis of: (1) a review of EPA-compiled site records, (2) evaluation of the EPA work plan, (3) a meeting with EPA and Weston, (4) study of area maps and several aerial photographs, and (5) a site visit, including interviews with ACS personnel.

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  - characterizations of landfill leachate.
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  - interaction between surface water and groundwater.
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Consistent with the phased approach, the four phases of the scope of work (Attachment 2) have purposely been presented as a framework to permit timely update. General investigative techniques are listed, but the details which can be specified best only after the field investigation has progressed (i.e., precise placement of each monitoring well) have been left undefined.

The focus of the first phase would be to define the problem; the second phase would be to characterize the natural setting; the third phase would be conducted to characterize the nature and extent of near surface contamination; and the fourth phase would be designed to further pinpoint the extent of contamination of the natural system, if that had not been accomplished by the conclusion of Phase III. Cooperation among the ACS facility, the Griffith Landfill, and the PRP group, would be essential to the development of an adequate site characterization for the design of remedial measures.

### Phase I - Problem Definition

Phase I would consist of gathering available information regarding the site and using non-invasive investigative techniques at the site to better define potential problems that should be investigated in subsequent phases.

Warzyn would obtain, review, and evaluate existing information which could help define the origin, history, nature, and extent of the environmental problems deriving from the ACS site. Included in the review would be the relevant publications by state and federal agencies (i.e.: IDNR, IDEM, EPA, USGS, ASCS, etc.). Climatological data, logs for private and public wells, and other data significant to the groundwater system would be obtained from the appropriate sources. Additionally, any available reports from previous investigations would be obtained for review and possible integration into this investigation.

Aerial photographs would be obtained for available dates back to 1955. These would be used to develop a site history, delineating excavated areas, filled areas, and areas used for drum storage. Several days would be spent on site correlating aerial-photo-observations to on-site anomalies. Additionally, personnel who worked for ACS, the Griffith Landfill, Kapica Inc., and other near-site operations would be interviewed about their recollections of operational practices and disposal areas. A magnetometer survey could be conducted to develop precise boundaries of buried drum areas.

A site topographic map would be developed from recent aerial photographs. Additionally, several surface water bench marks would be established and water levels would be recorded. The resulting data would be useful in documenting the interaction between surface and ground water and determining if the marshes which surround the site are discharge areas or recharge sources.

An environmental audit would be conducted of the ACS facility to determine if it currently contributes in any way to the groundwater system. For example, Warzyn is aware that ACS currently uses an unlined surface impoundment in its runoff/waste water system. That impoundment may be an ongoing source of releases to the environment. Therefore, in this phase, Warzyn would have to evaluate that site feature to determine the actual nature and extent of such contribution. The audit would include an examination of process streams and an assessment of the integrity of product piping, sewer piping, drains, and the effluent transport system. Site access and the cooperation of ACS management would be essential for successful completion of this task.

Phase II - Hydrogeologic Investigation

After any possible problem areas have been delineated in Phase I, the setting of those areas, in terms of the shallow groundwater flow system, would be characterized in Phase II. The focus of this phase would to determine the groundwater flow directions in the shallow aquifer and to characterize the groundwater quality at the perimeter of the site.

A detailed water table map would be necessary to define the flow directions and gradients across the site. A series of temporary piezometers and wells would be installed within the site in an approximately rectangular grid to augment the surface water level data and provide the groundwater elevation data necessary to develop a water table map for the upper aquifer. The groundwater grid would include a small number of site-perimeter monitoring wells and several leachate wells in the landfill. Slug tests, bail tests, or

pump tests would be conducted in each of the monitoring wells to determine the hydraulic properties of the aquifer. Placement of wells in the landfill would require cooperation from the Griffith Landfill.

To determine the extent, if any, of the current impact of ACS' ongoing operation on the groundwater flow system, a water budget would be conducted to account for the total water usage within the facility. The total water extracted from on-site wells or obtained from off-site sources would be compared to the volume of water discharged to sewers. Additionally a system would be established to monitor the quality of effluent discharged from plant operations. Performance of this task would require cooperation from ACS.

The information developed in Phases I and II would be synthesized using a groundwater flow model. Preliminary samples would be collected from the perimeter monitoring wells and the surface water to initiate characterization of the surface water and groundwater quality.

Phase III - Near Surface Contamination Investigation

The primary purpose of Phase III would be to characterize the waste and assess the character and extent of contamination in surface water and the shallow aquifer.

Buried waste areas, identified by Phase I and II activities, would be characterized by methods including soil boring and sampling and the placement of leachate wells (in the landfill and old still bottoms area). Additionally, a waste volume calculation would be made.

Additional monitoring wells would be placed to refine the delineation of contamination in the upper aquifer. If the results of analysis of groundwater samples collected from the perimeter wells in Phase II defined some areas of the shallow aquifer to be uncontaminated, soil borings would be made through these areas to the lower aquifer to extend the stratigraphic description of the site. Piezometers would be placed in each boring to provide an indication of the potentiometric orientation in the lower aquifer; bail or slug tests would be conducted to provide an estimate of the hydraulic properties of the lower aquifer.

The conceptual model of the groundwater flow system would be updated with the additional information developed in Phase III and, if appropriate, implemented as a contaminant transport model to aid in the calculation of potential pathways and travel times.

Phase IV - Additional Contamination Investigation

Additional phases of investigation would be developed as necessary to refine delineations of the extent of contamination in either the upper aquifer or the lower aquifer. These later phases would consist of single or small numbers of

sampling points or monitoring wells placed to fill gaps in the existing sampling network. The Feasibility Study would be conducted as described in the proposal which was submitted earlier.

Warzyn welcomes the opportunity to discuss the approach to this project with you and looks forward to working with the technical subcommittee to bring it to a successful conclusion. If you have questions please call us at 312/773-8484.

Respectfully Submitted,

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Joseph D. Adams Jr., P.E.
General Manger, Chicago

Peter J. Vagt, Ph.D.
Senior Hydrogeologist

Enclosures:
RI Objectives
Framework for the RI scope of work

251L03PV

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ATTACHMENT 1 -- Objectives for the Remedial Investigation
American Chemical Services Site RI/FS

Preliminary Objectives
- Define study area boundaries
- Establish grid & prepare site maps
- ~~Identify additional PRP's~~ no
- Identify all area water sources
- Identify all wells, document details
- Define Extent of buried drums in C E F G L
  to aid siting borings & test pits

these are not objectives, but rather, they are tasks.

Site Characterization Objectives

Geology:
- Define local and area stratigraphy o/c

Hydrology:
- Trace surface drainage pattern
- Determine relationship between surface and groundwater ok

Hydrogeology:
- Map regional water table configuration
- Determine hydraulic gradients
  - Vertically between aquifers
  - Horizontally in shallow aquifer
  - Horizontally in deep aquifer

o/c

Waste Characterization Objectives

To determine and characterize the location, nature, and volume of the contaminated areas on site including:

| | |
|---|---|
| F | Old Still Bottoms Ponds |
| G | Treatment Pond #1 |
| O L | Kapica Drum Site |
| E | On-Site Drum Containment Area |
| C | Off-Site Drum Containment Area |

ok

Endangerment Assessment Objectives

Define concentration and extent in:
- Surface water on and off site
- Sediment in site runoff areas
- Shallow groundwater
- Deep Aquifer

Identify potential receptors

Identify and characterize contaminant pathways

Extent of Contamination objectives.

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ATTACHMENT 2 - A Framework for the Proposed Scope of Work for the American Chemical Services RI/FS

I. PHASE I General PROBLEM DEFINITION

A. Review Available Information
   1. Published data (USGS, ASCS, etc.)
   2. Site visit and interviews
   3. Aerial photographs
   4. Water use survey
      a. Domestic wells
      b. Industrial and municipal wells — landfill, ATEC, FIT, etc.

B. Site Base Map
   1. Establish site grid
   2. Define site boundaries

C. Geophysical Survey
   1. Magnetometer/gradiometer
      a. On-site containment area
      b. Off-site containment area

contingencies if chosen technology is in appropriate!

D. Surface Water Survey
   1. Set up surface water bench marks

E. Environmental Audit of ACS
   1. Evaluate process streams
   2. Define potential sources

II. PHASE II - HYDROGEOLOGIC INVESTIGATION

A. Characterize Flow System
   1. Monitor ACS hydraulics
      a. Evaluate volumes
   2. Evaluate landfill hydraulics
      a. Install leachate wells
      b. Monitor de-watering pumpage

won't yield much info w/out wells nearby

   3. Develop site stratigraphy
      a. Install perimeter monitoring wells (soil borings)
   4. Test near surface hydraulic properties
   5. Map water table
      a. Piezometer grid ~ 50 jetted in
   6. Model groundwater flow system
      a. Conduct water balance — worthless
      b. Determine groundwater flow paths and rates

Temporary (3 months)

B. Preliminary INITIAL Shallow Sampling
   1. Surface water sampling
   2. Groundwater sampling from perimeter wells
   3. Effluent sampling

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n.d.

ATTACHMENT 2 (continued)

III. PHASE III -- NEAR SURFACE CONTAMINATION INVESTIGATION

A. Waste Characterization
   1. Soil borings at ACS (E F G M)
   2. Leachate Sampling
      a. Leachate Wells in Landfill
   3. Waste volume calculation

→ possibly conduct Phase II work earlier

B. Extent of Contamination (Upper Aquifer)
   1. Install new shallow monitoring wells
   2. Sample existing and new monitoring wells

C. Lower aquifer piezometers ~~in clean areas~~
   1. Extend stratigraphic description
   2. Conduct hydraulic property tests
   3 Sample existing and new wells

D. Groundwater Transport Model

IV. PHASE IV -- ADDITIONAL CONTAMINATION INVESTIGATION

Rem Phase II

A. Lower Aquifer Investigation

B. Further Delineation of Extent of Contamination

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discussions of the significance of each phase to the whole RI/FS process. For clarity of discussion, FS objectives and work scope are not included in this framework.

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PII ↓

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### Phase I - Problem Definition

Phase I would consist of gathering available information regarding the site and using non-invasive investigative techniques at the site to better define potential problems that should be investigated in subsequent phases.

Warzyn would obtain, review, and evaluate existing information which could help define the origin, history, nature, and extent of the environmental problems deriving from the ACS site. Included in the review would be the relevant publications by state and federal agencies (i.e.: IDNR, IDEM, EPA, USGS, ASCS, etc.). Climatological data, logs for private and public wells, and other data significant to the groundwater system would be obtained from the appropriate sources. Additionally, any available reports from previous investigations would be obtained for review and possible integration into this investigation.

Aerial photographs would be obtained for available dates back to 1955. These would be used to develop a site history, delineating excavated areas, filled areas, and areas used for drum storage. Several days would be spent on site correlating aerial-photo-observations to on-site anomalies. Additionally, personnel who worked for ACS, the Griffith Landfill, Kapica Inc., and other near-site operations would be interviewed about their recollections of operational practices and disposal areas. A magnetometer survey could be conducted to develop precise boundaries of buried drum areas. A site topographic map would be developed from recent aerial photographs. Additionally, several surface water bench marks would be established and water levels would be recorded. The resulting data would be useful in documenting the interaction between surface and ground water and determining if the marshes which surround the site are discharge areas or recharge sources.

An environmental audit would be conducted of the ACS facility to determine if it currently contributes in any way to the groundwater system. For example, Warzyn is aware that ACS currently uses an unlined surface impoundment in its runoff/waste water system. That impoundment may be an ongoing source of releases to the environment. Therefore, in this phase, Warzyn would have to evaluate that site feature to determine the actual nature and extent of such contribution. The audit would include an examination of process streams and an assessment of the integrity of product piping, sewer piping, drains, and the effluent transport system. Site access and the cooperation of ACS management would be essential for successful completion of this task.

Phase II - Hydrogeologic Investigation

After any possible problem areas have been delineated in Phase I, the setting of those areas, in terms of the shallow groundwater flow system, would be characterized in Phase II. The focus of this phase would to determine the groundwater flow directions in the shallow aquifer and to characterize the groundwater quality at the perimeter of the site.

A detailed water table map would be necessary to define the flow directions and gradients across the site. A series of temporary piezometers and wells would be installed within the site in an approximately rectangular grid to augment the surface water level data and provide the groundwater elevation data necessary to develop a water table map for the upper aquifer. The groundwater grid would include a small number of site-perimeter monitoring wells and several leachate wells in the landfill. Slug tests, bail tests, or

pump tests would be conducted in each of the monitoring wells to determine the hydraulic properties of the aquifer. Placement of wells in the landfill would require cooperation from the Griffith Landfill.

To determine the extent, if any, of the current impact of ACS' ongoing operation on the groundwater flow system, a water budget would be conducted to account for the total water usage within the facility. The total water extracted from on-site wells or obtained from off-site sources would be compared to the volume of water discharged to sewers. Additionally a system would be established to monitor the quality of effluent discharged from plant operations. Performance of this task would require cooperation from ACS.

The information developed in Phases I and II would be synthesized using a groundwater flow model. Preliminary samples would be collected from the perimeter monitoring wells and the surface water to initiate characterization of the surface water and groundwater quality.

Phase III - Near Surface Contamination Investigation

The primary purpose of Phase III would be to characterize the waste and assess the character and extent of contamination in surface water and the shallow aquifer.

Buried waste areas, identified by Phase I and II activities, would be characterized by methods including soil boring and sampling and the placement of leachate wells (in the landfill and old still bottoms area). Additionally, a waste volume calculation would be made.

Additional monitoring wells would be placed to refine the delineation of contamination in the upper aquifer. If the results of analysis of groundwater samples collected from the perimeter wells in Phase II defined some areas of the shallow aquifer to be uncontaminated, soil borings would be made through these areas to the lower aquifer to extend the stratigraphic description of the site. Piezometers would be placed in each boring to provide an indication of the potentiometric orientation in the lower aquifer; bail or slug tests would be conducted to provide an estimate of the hydraulic properties of the lower aquifer.

The conceptual model of the groundwater flow system would be updated with the additional information developed in Phase III and, if appropriate, implemented as a contaminant transport model to aid in the calculation of potential pathways and travel times.

Phase IV - Additional Contamination Investigation

Additional phases of investigation would be developed as necessary to refine delineations of the extent of contamination in either the upper aquifer or the lower aquifer. These later phases would consist of single or small numbers of

sampling points or monitoring wells placed to fill gaps in the existing sampling network. The Feasibility Study would be conducted as described in the proposal which was submitted earlier.

Warzyn welcomes the opportunity to discuss the approach to this project with you and looks forward to working with the technical subcommittee to bring it to a successful conclusion. If you have questions please call us at 312/773-8484.

Respectfully Submitted,

WARZYN ENGINEERING INC.

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Enclosures:
RI Objectives
Framework for the RI scope of work

251L03PV

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ATTACHMENT 1 -- Objectives for the Remedial Investigation
American Chemical Services Site RI/FS

Preliminary Objectives
- Define study area boundaries
- Establish grid & prepare site maps
- Identify additional PRP's
- Identify all area water sources
- Identify all wells, document details
- Define Extent of buried drums in C E F G L to aid siting borings & test pits

Site Characterization Objectives

Geology:
- Define local and area stratigraphy

Hydrology:
- Trace surface drainage pattern
- Determine relationship between surface and groundwater

Hydrogeology:
- Map regional water table configuration
- Determine hydraulic gradients
  - Vertically between aquifers
  - Horizontally in shallow aquifer
  - Horizontally in deep aquifer

Waste Characterization Objectives

To determine and characterize the location, nature, and volume of the contaminated areas on site including:

| | |
|---|---|
| F | Old Still Bottoms Ponds |
| G | Treatment Pond #1 |
| O L | Kapica Drum Site |
| E | On-Site Drum Containment Area |
| C | Off-Site Drum Containment Area |

Endangerment Assessment Objectives
- Define concentration and extent in:
  - Surface water on and off site
  - Sediment in site runoff areas
  - Shallow groundwater
  - Deep Aquifer
- Identify potential receptors
- Identify and characterize contaminant pathways

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ATTACHMENT 2 - A Framework for the Proposed Scope of Work for the American Chemical Services RI/FS

I. PHASE I - PROBLEM DEFINITION

A. Review Available Information
   1. Published data (USGS, ASCS, etc.) + reports
   2. Site visit and interviews
   3. Aerial photographs
   4. Water use survey
      a. Domestic wells
      b. Industrial and municipal wells
   5. Get info from RCRA files
B. Site Base Map
   1. Establish site grid
   2. Define site boundaries in field - using surveyor
C. Geophysical Survey
   1. Magnetometer/gradiometer -
      a. On-site containment area
      b. Off-site containment area
D. Surface Water Survey
   1. Set up surface water bench marks -
E. Environmental Audit of ACS
   1. Evaluate process streams
   2. Define potential sources
   3 Check RCRA

II. PHASE II - HYDROGEOLOGIC INVESTIGATION

A. Characterize Flow System
   1. Monitor ACS hydraulics
      a. Evaluate volumes
   2. Evaluate landfill hydraulics
      a. Install leachate wells
      b. Monitor de-watering pumpage
   3. Develop site stratigraphy
      a. Install perimeter monitoring wells (soil borings)
   4. Test near surface hydraulic properties
   5. Map water table
      a. Piezometer grid
   6. Model groundwater flow system
      a. Conduct water balance
      b. Determine groundwater flow paths and rates

B. Preliminary Shallow Sampling
   1. Surface water sampling
   2. Groundwater sampling from perimeter wells
   3. Effluent sampling

Eval. need for MW at Phase II/III

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